MULTIMEDIA UNIVERSITY

STUDENT ID NO

MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 3, 2022/2023

EME 4216 – QUALITY MANAGEMENT
(ME)

3rd OCTOBER 2023
9.00 a.m. – 11.00 a.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 3 pages (including cover page) with FOUR questions.

2. Attempt ALL questions. All questions carry equal marks and the distribution of the marks for each question is given.

3. Please write all your answers in the answer booklet provided.

Question 1

a) You are tasked with addressing a recurring quality issue in a manufacturing process affecting the final product's performance. Describe the 7 steps you would take to systematically identify the root cause of the problem and suggest potential solutions.

(14 marks)

b) In the context of quality management, various tools are used to analyze and improve processes. Choose one quality tool from the list below and explain how it can be applied to identify and solve a quality issue in a mechanical engineering project:

i. Fishbone Diagram (Ishikawa Diagram)
ii. Pareto Chart
iii. Scatter Diagram
iv. Control Chart
v. Histogram

(11 marks)

Question 2

a) Explain the concept of Total Quality Management (TQM) and how it can be applied in a mechanical engineering context to improve overall product quality.

(11 marks)

b) The role of top management in the implementation of total quality is pivotal and instrumental to the success of the initiative. Top management plays a leadership role in fostering a culture of quality throughout the organization. List and give explanations of the key responsibilities of the top management.

(14 marks)

Continued...

Question 3

a) Define the Six Sigma concept and outline its key principles. Provide an example of how Six Sigma can be used in a mechanical engineering project to reduce defects.

(13 marks)

b) A manufacturing company produces mechanical components with a critical dimension that should measure 120 mm. The process has been experiencing variability, leading to defects. The company wants to implement the Six Sigma methodology to improve the process. Explain the DMAIC framework of Six Sigma

(12 marks

Question 4

a) Describe the principles of Lean operation and provide an example of how Lean principles can be applied to streamline the production of a mechanical component in a manufacturing plant.

(17 marks)

b) Kaizen is the name given by the Japanese to the concept of continual incremental improvement. Kai means "change" and zen means "good." Kaizen", therefore, means making changes for the better on a continual, never-ending basis. The improvement aspect of Kaizen refers to people, processes, and products. Explain how the Kaizen philosophy can be applied in a mechanical engineering context to enhance the efficiency of a manufacturing process. Provide specific steps and examples to illustrate its implementation.

(8 marks)

End of Paper.